

- 21 -

**Claims:**

1. Process for the separation and purification of an aqueous mixture comprising the main components acetic acid, formic acid and high boilers by extraction with a solvent in a circulation process, which comprises feeding the raffinate stream containing a major part of the water to a solvent stripping column (11) for removal of the water and conveying the extract stream to a solvent distillation column (8) from which, in a first step, a mixture (A) comprising water and solvent is separated off via the top and a mixture (B) comprising acetic acid, formic acid and high boilers is separated off via the bottom, separating the formic acid off from the mixture (B) in column (29) and subsequently fractionating the remaining mixture (B) into pure acetic acid and high boilers in an acetic acid distillation column, and conveying the mixture (A) to a phase separator from which the aqueous phase containing residual solvent is recirculated to the solvent stripping column (11) and the organic phase is recirculated to the extractor (7).
2. Process according to Claim 1, characterized in that the solvent distillation column (8) is operated under atmospheric pressure.

3. Process according to Claim 1, characterized in that the solvent distillation column (8) is operated under a superatmospheric pressure of from  $1 \cdot 10^5$  to  $50 \cdot 10^5$  Pa.
4. Process according to any of Claims 1 to 3, characterized in that the extractor is operated in one or more stages.
5. Process according to any of Claims 1 to 4, characterized in that the solvent circuit in the extractor runs countercurrent to the crude acid.
6. Process according to any of Claims 1 to 5, characterized in that the solvent used comprises saturated, unsaturated and/or cyclic hydrocarbons having from 4 to 8 carbon atoms.
7. Process according to any of Claims 1 to 5, characterized in that the solvent used is one or more compounds selected from the group consisting of ethers, esters, ketones, hydrocarbons and alcohols.
8. Process according to any of Claims 1 to 7, characterized in that the solvent used is one or more compounds selected from the group consisting of methyl tert-butyl ether, diisopropyl ether, di-n-propyl ether, ethyl butyl ether, ethyl acetate and isopropyl acetate.
9. Process according to any of Claims 1 to 8, characterized in that the extraction is carried out at

temperatures of from 0 to 60°C and pressures of from  $1 \times 10^5$  to  $20 \times 10^5$  Pa.

10. Process according to any of Claims 1 to 9, characterized in that the mixing ratio of solvent to crude acid (volume/volume) is from 0.5 to 20.

11. Process according to any of Claims 1 to 10, characterized in that the intermediate distillation column (29) is operated at a pressure of from  $1 \times 10^5$  Pa to  $50 \times 10^5$  Pa.

12. Process according to any of Claims 1 to 11, characterized in that the solvent distillation column (8) is operated in such a way that small amounts of water remain in the product stream.

13. Process according to any of Claims 1 to 12, characterized in that the intermediate distillation column (29) is equipped with a side offtake at which a substream is taken off.

14. Process according to any of Claims 1 to 13, characterized in that the mixture (B) comprising the components acetic acid, formic acid, high boilers and residual water is fractionated in an intermediate distillation column (29) into a bottom product which is free of formic acid and comprises acetic acid and high boilers and a mixed top product comprising formic acid, water and small amounts of acetic acid, where the bottom product from column

-24-

(29) is fractionated in a downstream acetic acid distillation column (5) into pure acetic acid and high boilers and the top product from column (29) is fed to a pure formic acid distillation column (33) where it is fractionated into pure formic acid as top product and a mixed bottom product comprising acetic acid, formic acid and water which is recirculated to the extract stream to the solvent distillation column (8).

15. Process according to Claim 14, characterized in that the pure formic acid distillation column (33) is operated at a pressure which is from  $0.1 \times 10^5$  to  $25 \times 10^5$  Pa lower than that in the intermediate distillation column (29).

16. Process according to any of Claims 1 to 15, characterized in that the heat of condensation in the distillation column (29) is used for heating the formic acid distillation column (33) and/or the solvent distillation column (11).

17. Process according to any of Claims 1 to 16, characterized in that the heat of reaction of the upstream reaction is used for heating one or more of the solvent distillation column (8), the distillation column (29), the acetic acid distillation column (5) and the formic acid distillation column (33).

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6